APPENDIX C

FIELD CHANGE REQUESTS

FIELD CHANGE REQUEST (FCR) FORM
FWEC/CHURCH ROAD TCE SITE, MOUNTAIN TOP, PENNSYLVANIA

Project Name: FWEC/Church Road TCE Site Project Number: 106-8706.0031
Client: Foster Wheeler Energy Corp. Request Number: **FCR-01**
Field Change Request Title: Additional Field Activities Based on Confirmatory Site Reconnaissance

To: (b) (4) [redacted] Location: Morris Plains, NJ
Date: August 23, 2011

Description:

As part of the Reconnaissance of Potential Sources, as described in Section 3.1.2.3 of the Draft Final RI/FS Work Plan dated March 25, 2010 (Work Plan), the former Shot Blast Sands Storage Area and Expended Waste Area were visually assessed on Thursday, October 28, 2010 by representatives of TtEC, FWEC and USEPA. The locations of these two areas are denoted on Figure 3-1 of the Work Plan. The reconnaissance was conducted to evaluate the presence or absence of evidence of environmental concerns (e.g., staining, stressed vegetation, etc.) at the two areas.

The site visit indicated the former Shot Blast Sands Storage Area contained areas of sparse vegetation. The surface of the property in this area appeared to contain very densely packed sandy material. Topography is relatively level, with a slight downward slope to the north.

Reconnaissance of the former Expended Waste Area showed a relatively level, mostly vegetated area. Sections of former concrete slabs and footings were visible. The area is surrounded by vegetation including trees.

Reason for Change:

Based on the confirmatory site reconnaissance and lack of laboratory results for the former Shot Blast Sands Storage Area and the Expended Waste Area, it is recommended that additional sampling activities be performed to determine the absence or presence of potential environmental concerns in these two areas.

Recommended Disposition:

The following proposed sampling activities for the former Shot Blast Sands Storage Area and Expended Waste Area are in addition to those outlined in the Work Plan and Sampling and Analysis Plan (SAP) for the project. Reference should be made, as required, to these documents for sample collection and management procedures. Additions to Work Plan Table 3-1 and Field Sampling Plan Table 4-1 are attached to this FCR and contain information on these additional activities, including analytical methodologies. The proposed sample locations are provided on Figure 1 for the Shot Blast Sands Storage Area and Figure 2 for the Expended Waste Area. The locations may be refined during the field activities based on site-specific conditions at the time of sampling.

- Shot Blast Sands Storage Area – Five (5) sampling locations are recommended for this area, with four locations biased to areas with no vegetation and one placed down gradient of the area, estimated to be in a northward direction, to assess the potential surface runoff drainage pathway. Surface (0 to 6 inches) soil samples will be collected

for Target Compound List (TCL) Semi-Volatile Organic Compound (SVOC) and Target Analyte List (TAL) metals analyses.

- Expended Waste Area – Four (4) sampling locations are recommended for this area, with two locations placed within the area and two placed down gradient of the area, estimated to be in a southwest direction, to assess the potential surface runoff drainage pathway. Surface (0 to 6 inches) soil samples will be collected for TCL SVOC and TAL metals analyses.

Field personnel will ensure that the surface soil samples do not contain likely polycyclic aromatic hydrocarbon (PAH)-containing materials such as asphalt, pieces of treated wood, etc., especially as a network of railroad lines historically existed at the site.

(b) (4)	(b) (4)	08/23/2011
Project Chemist, Tetra Tech EC, Inc.	Signature	Date

Disposition:

I have reviewed this change request, and recommend conducting additional sampling activities as described above.

(b) (4)	(b) (4)	8/23/11
Project Manager, Tetra Tech EC, Inc.	Signature	Date

Distribution:

Project Manager
Field Operations Lead
QA Officer
Project File

Other:
FWEC Project Manager
US Environmental Protection Agency

Addition to Table 3-1 of WP

Sample Media or Investigation Method	Technical Approach	Amount of RI Field Investigation Locations	Analytical Parameters[1]	Sampling or Investigation Activity Objective	Data Needs Addressed[2]	Applicable Standard Operating Procedures[3]	Figure Cross-Reference[4]
Former Shot Blast Sands Storage Area							
Surface Soil	Grab Samples	5	TCL SVOCs; TAL Metals	Determine presence or absence of potential contamination	1	26	Figure 1
Former Expended Waste Area							
Surface Soil	Grab Samples	4	TCL SVOCs; TAL Metals	Determine presence or absence of potential contamination	1	26	Figure 2

[1] - Refer to Tables of the Field Sampling Plan/Quality Assurance Project Plan.
[2] - Refer to Section 2.1 of RI/FS Work Plan.
[3] – See attached.
[4] – See attached.

Addition to Table 4-1 of FSP

Sample Type	TCL SVOCs+20		TAL Metals	
	Number of Primary Samples	Number of Field Duplicates	Number of Primary Samples	Number of Field Duplicates
PRIMARY SAMPLES				
Surface Soil	9	1	9	1
QUALITY ASSURANCE/QUALITY CONTROL				
Field Blanks[(1)]	1	--	1	--
Trip Blanks	--	--	--	--
Matrix Spike/Matrix Spike Duplicates	1	--	1	--

[(1)] – Only required when non-dedicated, non-disposable equipment is utilized.

Surface Soil Sampling (SOP 26)

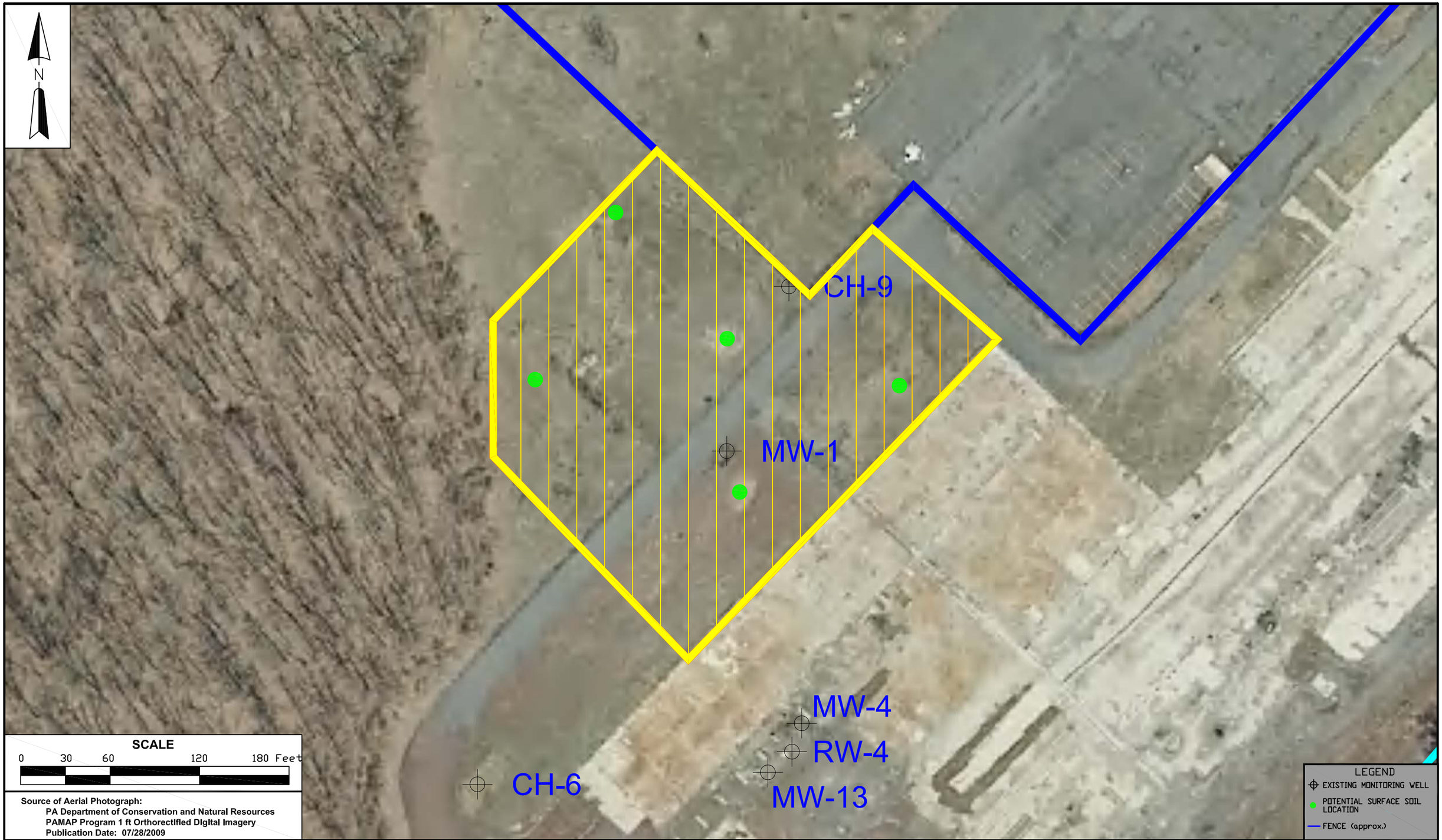
1. Use either a disposable plastic or a decontaminated stainless steel spoon, shovel, trowel, grab sampler, or corer to scrape away surficial organic material (grass, leaves, etc.).

2. Obtain surface soil material using the spoon/shovel/trowel/grab sampler/corer from the surface to 6 inches below the ground surface (bgs). Collect a sufficient volume of soil for all parameters of interest and place into either a disposable or a decontaminated bowl or pan.

3. Homogenize soil within the bowl/pan with the spoon/shovel/trowel/grab sampler/corer. Remove rocks, twigs, leaves and other large debris as appropriate. Fill sample containers for the required chemical parameters.

4. Complete sample labels and chain of custody forms. Record sample information in the field logbook.

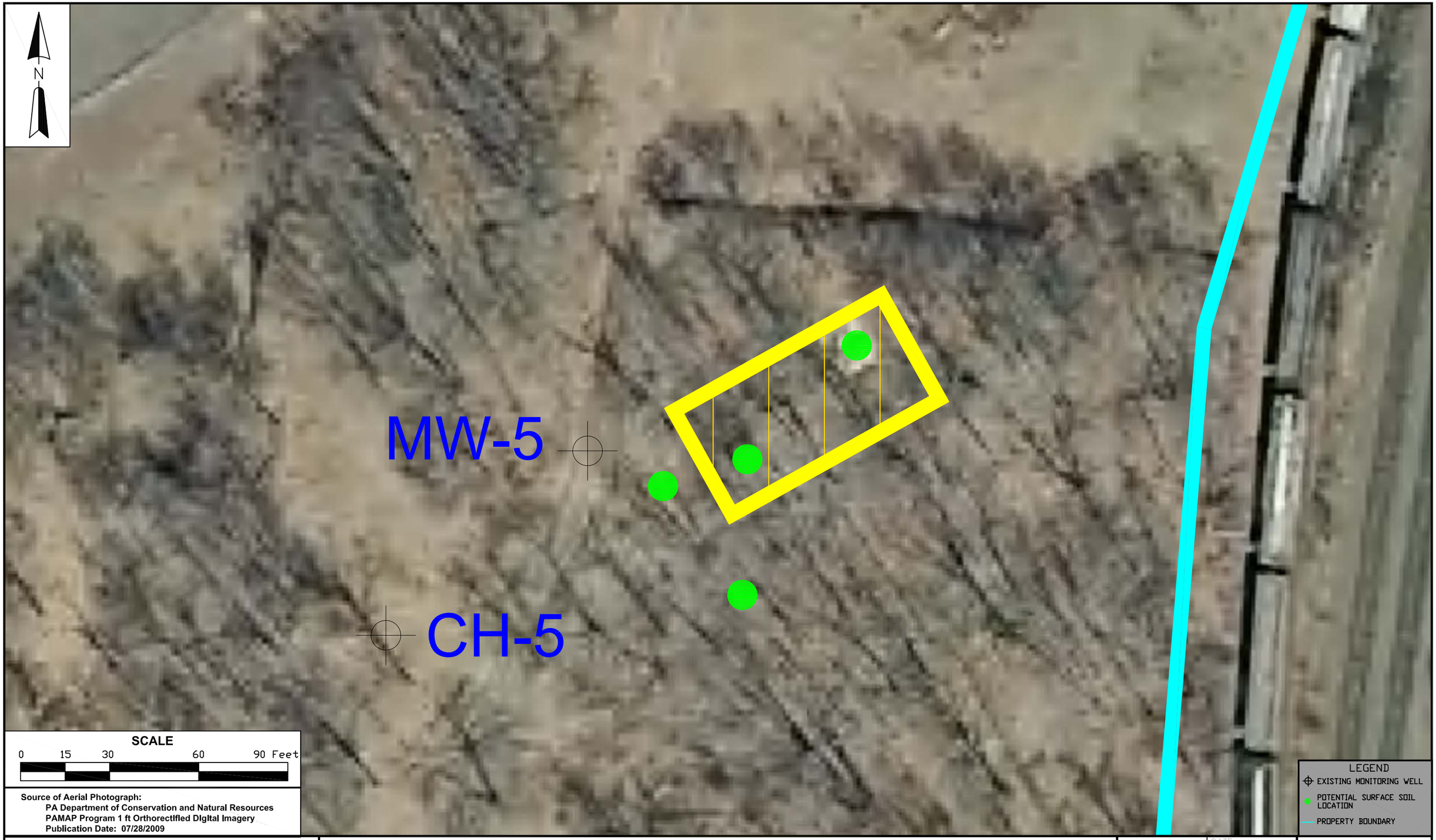
5. Place the analytical samples in coolers for shipment and chill to $\leq 4^{o}C$.



TETRA TECH EC, INC.

TITLE:
Proposed Surface Soil Sample Locations for Shot Blast Sands Area
Based on Detailed Site Reconnaissance – Former FWEC Facility Property
FWEC/Church Road TCE Site, Mountain Top, Pennsylvania

DWN.:	DATE: 8/23/11	PROJECT NO.: 106-8706	
CHKD:	REV.: 1	FIGURE NO.: 1	
DES.:	APPD:		



TETRA TECH EC, INC.

TITLE:
Proposed Surface Soil Sample Locations for Expended Waste Area
Based on Detailed Site Reconnaissance – Former FWEC Facility Property
FWEC/Church Road TCE Site, Mountain Top, Pennsylvania

DWN.:	DATE: 8/18/11	PROJECT NO.: 106-8706	
CHKD:	REV.: 1	FIGURE NO.: 2	
DES.:	APPD:		

FIELD CHANGE REQUEST (FCR) FORM
FWEC/CHURCH ROAD TCE SITE, MOUNTAIN TOP, PENNSYLVANIA

Project Name: FWEC/Church Road TCE Site | Project Number: 106-8706.0031

Client: Foster Wheeler Energy Corp. | Request Number: **FCR-02**

Field Change Request Title: Reduce neutron porosity measurements to be performed only in boring associated with matrix diffusion testing.

To: (b) (4) [redacted] | Location: Morris Plains, NJ

Date: August 23, 2011

Description:

Section 3.1.6.3 of the Draft Final RI/FS Work Plan dated March 25, 2010 indicates that neutron porosity is to be performed in all borings associated with bedrock monitoring well installation. At the request of Tetra Tech EC, and to limit the use of radioactive materials as part of the remedial investigation, it is recommended to perform neutron porosity measurements only at the on-site boring location that also will be used for the matrix diffusion evaluation. The neutron porosity measurements will be evaluated in conjunction with the matrix diffusion data collected at this location.

Reason for Change:

To limit the use of radioactive materials as part of the remedial investigation. Reduce neutron porosity measurements to be performed only in the soil boring associated with matrix diffusion testing.

(b) (4) [redacted]	(b) (4) [redacted]	8/23/11
Project Scientist, Tetra Tech EC, Inc.	Signature	Date

Disposition:

I have reviewed this change request, and recommend modifying the neutron porosity sampling activities as described above.

(b) (4) [redacted]	(b) (4) [redacted]	8/23/11
Project Manager, Tetra Tech EC, Inc.	Signature	Date

Distribution:

Project Manager
Field Operations Lead
QA Officer
Project File

Other:
FWEC Project Manager
US Environmental Protection Agency

FIELD CHANGE REQUEST (FCR) FORM
FWEC/CHURCH ROAD TCE SITE, MOUNTAIN TOP, PENNSYLVANIA

Project Name: FWEC/Church Road TCE Site
Project Number: 106-8706.0031
Client: Foster Wheeler Energy Corp.
Request Number: **FCR-03**

Field Change Request Title: Adjust and/or add sample locations and/or laboratory analyses, based on the Site Reconnaissance with representatives of TtEC, BTAG and USEPA.

To: (b) (4) [redacted]
Location: Morris Plains, NJ
Date: August 19, 2011

Description:

1) At the request of BTAG, add an additional Surface Water, Sediment and Pore Water station (designated as SW/SD-30) at spring discharge on Watering Run between SW/SD-05 and SW/SD-06.

2) At the request of BTAG, minor relocation of the following stations:
   - SW/SD-12 – Move location upstream approximately 50 feet to the pool area below the culvert.
   - SW/SD-24 – Move location upstream approximately 100 feet on the tributary.
   - SW/SD/PW-27 – Move location upstream approximately 25 feet to the sand bar.

3) At the recommendation of BTAG, add pore water sample to SW/SD-24 and redesignate location as SW/SD/PW-24.

4) At recommendation of TtEC and BTAG, move pore water (PW) sample from SW/SD/PW-08 to SW/SD-07 with new designations of SW/SD-08 and SW/SD/PW-07.

5) At the recommendation of TtEC and BTAG, move pore water (PW) sample from SW/SD/PW-18 to SW/SD-17 with new designations of SW/SD-18 and SW/SD/PW-17.

6) At the request of BTAG, add the collection of Surface Water and Sediment samples for inorganic analysis from 6 locations (20%) during the low flow sampling event; the locations will be evenly distributed along the proposed sampling locations in Watering Run.

Reason for Change:

Adjust and/or add sample locations and/or laboratory analyses, based on the Site Reconnaissance with representatives of TtEC, BTAG and USEPA.

(b) (4) [redacted]
Ecologist, Tetra Tech EC, Inc.

(b) (4) [redacted]
Signature

8/19/11
Date

Disposition:

I have reviewed this change request, and recommend modifying the surface water, sediment and pore water sampling locations as described above.

(b) (4) [redacted]
Project Manager, Tetra Tech EC, Inc.

(b) (4) [redacted]
Signature

8/23/11
Date

Distribution:

Project Manager
Field Operations Lead
QA Officer
Project File

Other:
FWEC Project Manager
US Environmental Protection Agency

FIELD CHANGE REQUEST (FCR) FORM
FWEC/CHURCH ROAD TCE SITE, MOUNTAIN TOP, PENNSYLVANIA

Project Name: FWEC/Church Road TCE Site
Project Number: 106-8706.0031
Client: Foster Wheeler Energy Corp.
Request Number: **FCR-04**
Field Change Request Title: Change in precipitation requirement for low flow surface water and sediment sampling event

To: (b) (4) [redacted]
Location: Morris Plains, NJ
Date: August 19, 2011

Description:

Section 3.1.7 of the Draft Final RI/FS Work Plan dated March 25, 2010 indicates the low flow sampling event will occur "only after confirmation of a period of no precipitation lasting at least seven days." It is recommended that the low flow surface water and sediment sampling event be conducted when the average precipitation for a 7-day period immediately prior to the sampling event is less than 0.12 inches. In addition, trace or no precipitation shall be observed for a minimum of 24-hours prior to initiating the sampling event.

Reason for Change:

Due to frequent afternoon thunderstorms that occur in the vicinity of the project area, the likelihood of seven (7) consecutive days with no precipitation is low. NOAA seasonal weather data for June-August from 1971 through 2000 indicate an average precipitation of 0.12 inches per day for this period. In 2010, the average daily precipitation for June-August was 0.09 inches. Average rainfall below the long-term average (i.e., 0.12 inches) for a period of seven days immediately prior to the sampling event, with trace or no rainfall for at least 24 hours prior to the sampling event, will not adversely impact the sampling objective, which is to determine the potential for groundwater communication with surface water within Watering Run and adjacent tributaries during low flow conditions.

(b) (4) [redacted]	(b) (4) [redacted]	8/19/11
Ecologist, Tetra Tech EC, Inc.	Signature	Date

Disposition:

I have reviewed this change request, and recommend performing the surface water and sediment sampling event in accordance with the conditions discussed above.

(b) (4) [redacted]	(b) (4) [redacted]	8/23/11
Project Manager, Tetra Tech EC, Inc.	Signature	Date

Distribution:

Project Manager
Field Operations Lead
QA Officer
Project File

Other:
FWEC Project Manager
US Environmental Protection Agency

FIELD CHANGE REQUEST (FCR) FORM
FWEC/CHURCH ROAD TCE SITE, MOUNTAIN TOP, PENNSYLVANIA

Project Name: FWEC/Church Road TCE Site Project Number: 106-8706.0031

Client: Foster Wheeler Energy Corp. Request Number: FCR-05

Field Change Request Title: Bottleware Change for Volatile Organic Compounds in Sediment Samples

To: (b) (4) [redacted] Location: Morris Plains, NJ

Date: August 24, 2011

Description:

It is recommended that collection of sediment for volatile organic compound (VOC) analysis occur in two 4-ounce glass jars. Currently, Table 4-2 of the Field Sampling Plan lists the required bottleware as three EnCore® samplers and one 4-ounce glass jar.

Reason for Change:

The laboratory requires two 4-ounce glass jars to have sufficient sample volume to perform the analysis and meet the required screening values for sediment.

Recommended Disposition:

Recommend to adopt as proposed; collecting and shipping two 4-ounce bottles of sediment to the laboratory for VOC analysis. This change would comply with bottleware requirements of the analytical method and EPA and PADEP guidelines for sample collection/shipping.

(b) (4) [redacted] — Project Chemist, Tetra Tech EC, Inc. (b) (4) [redacted] — Signature 08/24/2011 — Date

Disposition:

I have reviewed this change request, and recommend conducting the sampling activities as described above.

(b) (4) [redacted] — Project Manager, Tetra Tech EC, Inc. (b) (4) [redacted] — Signature 8/24/11 — Date

Distribution:

Project Manager
Field Operations Lead
QA Officer
Project File

Other:
FWEC Project Manager
US Environmental Protection Agency

FIELD CHANGE REQUEST (FCR) FORM
FWEC/CHURCH ROAD TCE SITE, MOUNTAIN TOP, PENNSYLVANIA

Project Name: FWEC/Church Road TCE Site Project Number: 106-8706.0031

Client: Foster Wheeler Energy Corp. Request Number: FCR-06

Field Change Request Title: Collection of interim GW samples at RMW-02S-1, RMW-02S-2, RMW-04S-1 and RMW-04S-2

To: (b) (4) Location: Morris Plains, NJ

Date: December 19, 2011

Description:

It is recommended that collection of interim groundwater samples be performed at RMW-02S-1, RMW-02S-2, RMW-04S-1 and RMW-04S-2. Groundwater samples will be collected from each of the wells in accordance with sampling procedures identified in the RI/FS Work Plan. Samples will be analyzed for TCL VOCs+10 (including additional/select VOCs), formaldehyde, TCL SVOCs+20, TAL metals, CN, PCBs, and 1,4-dioxane.

Reason for Change:

Interim groundwater samples will provide preliminary data regarding constituents present in shallow groundwater in the vicinity of the surrounding industrial properties. These data will aid in the placement and construction of future overburden and bedrock wells in the surrounding industrial properties area.

Recommended Disposition:

Recommend to adopt as proposed.

(b) (4) (b) (4) 12/20/2011

Project Chemist, Tetra Tech EC, Inc. Signature Date

Disposition:

I have reviewed this change request, and recommend conducting the sampling activities as described above.

(b) (4) (b) (4) 12/20/2011

Project Manager, Tetra Tech EC, Inc. Signature Date

Distribution:

Project Manager
Field Operations Lead
QA Officer
Project File

Other:
FWEC Project Manager
US Environmental Protection Agency

FIELD CHANGE REQUEST (FCR) FORM
FWEC/CHURCH ROAD TCE SITE, MOUNTAIN TOP, PENNSYLVANIA

Project Name: FWEC/Church Road TCE Site Project Number: 106-8706.0031

Client: Foster Wheeler Energy Corp. Request Number: FCR-07

Field Change Request Title: Installation of shallow overburden well at RMW-03 location

To: (b) (4) Location: Morris Plains, NJ

Date: August 27, 2012

Description:

It is recommended that an overburden well be installed adjacent to RMW-03D on the CertainTeed property. The drilling and well installation should be performed in accordance with the requirements for overburden wells in the approved RI/FS Work Plan.

Reason for Change:

RMW-03D was installed by drilling through the overburden pursuant to the RI/FS Work Plan. The top of the bedrock was encountered at approximately 188 feet below ground surface, significantly deeper than the anticipated 100 feet, based on data available at the time of RI/FS Work Plan preparation. Therefore, there is a data gap for the overburden conditions at this location.

Recommended Disposition:

Advance and log a boring to the top of competent bedrock adjacent to RMW-03D, and install one overburden groundwater monitoring well at this boring location. The work will be conducted pursuant to the approved RI/FS Work Plan. A recommendation for construction of the monitoring well will be made after review of the boring log.

(b) (4) — Project Geologist, Tetra Tech EC, Inc.

(b) (4) — Signature

8/27/2012 — Date

Disposition:

I have reviewed this change request, and recommend conducting the additional investigation activities as described above.

(b) (4) — Project Manager, Tetra Tech EC, Inc.

(b) (4) — Signature

8/27/12 — Date

Distribution:

Project Manager
Field Operations Lead
QA Officer
Project File

Other:
FWEC Project Manager
US Environmental Protection Agency

FIELD CHANGE REQUEST (FCR) FORM
FWEC/CHURCH ROAD TCE SITE, MOUNTAIN TOP, PENNSYLVANIA

Project Name: FWEC/Church Road TCE Site Project Number: 106-8706.0031

Client: Foster Wheeler Energy Corp. Request Number: FCR-08

Field Change Request Title: Clarifications/Modifications to Groundwater Sampling Program – Round 1

To: (b) (4) [redacted] Location: Morris Plains, NJ

Date: May 2, 2013

Description:

The following clarifications/modifications to the groundwater sampling program are recommended for the first round of groundwater sampling:

1) (Clarification) The Work Plan identified several pump alternatives for the collection of groundwater samples. Groundwater sampling will be performed using bladder pumps.
2) (Modification) Dedicated polyethylene tubing for both the air and return/sampling lines will be used for groundwater sampling instead of Teflon-lined tubing specified in the Work Plan.
3) (Clarification) Water quality parameters will be considered stabilized based on the specific parameters included in SOP #19, Item #12 (± 0.1 for pH, ± 3 percent for specific conductance, ± 10 percent for dissolved oxygen, ± 10 percent or less than 50 NTU for turbidity, ± 10 mV for Eh), rather than 10% for all parameters as indicated in the Field Sampling Plan, section 3.2.12.
4) (Clarification) Wells will be purged until water quality parameters have stabilized per SOP #19, Item #12, or for a maximum of 2-hours. Samples will be collected after a maximum of 2 hours of purging.
5) (Modification) Synoptic groundwater levels will be collected at the conclusion of the groundwater sampling event, rather than prior to the sampling event.
6) (Clarification) The attached table identifies the specific analyses that will be performed for each groundwater sample.

Reason for Change:

The following rationale is provided for the recommended clarifications/modifications recommended above. The rationale corresponds numerically with the descriptions cited above:

1) Bladder pumps are an efficient and acceptable means of low-flow groundwater sample collection.
2) Polyethylene tubing is a significantly less costly alternative to Teflon-lined tubing and is a generally acceptable alternative for low-flow groundwater sampling in Region 3 and has been utilized on other USEPA Superfund Sites.
3) Water quality parameters are recommended to meet the requirements specified in SOP #19, Item #12 because the recommended variation is more specific to the individual parameters as opposed to a uniform 10% variation.
4) It is a generally accepted industry standard to collect a groundwater sample after a maximum of two hours of low-flow purging, even if the water quality parameters have not stabilized pursuant to guidance, because after that period of time, laminar flow into the well would have been achieved.
5) Installation of RMW-03S will not be completed until after the groundwater sampling event has been initiated. Performing the synoptic groundwater measurements at the conclusion of the sampling event will allow for this well to be included in the measurements.
6) The Work Plan indicates that specific parameters to be analyzed for each well would be determined based on data needs and in consultation with USEPA. This table provides

specific recommendations for the analysis of the groundwater sample collected from each well location.

Recommended Disposition:

The above represent clarifications and minor modifications to the Work Plan for items associated with the collection and analysis of groundwater samples for the first groundwater sampling event. It is recommended that the sampling event be performed in accordance with these clarifications and incorporating the minor modifications proposed.

(b) (4) [redacted] — Project Geologist, Tetra Tech, Inc.

(b) (4) [redacted] — Signature

5/2/2013 — Date

Disposition:

I have reviewed this change request, and recommend conducting the groundwater sampling investigation (Round 1) in accordance with the Work Plan as clarified/modified above.

(b) (4) [redacted] — Project Manager, Tetra Tech, Inc.

(b) (4) [redacted] — Signature

5/2/13 — Date

Distribution:

Project Manager
Field Operations Lead
QA Officer
Project File

Other:
FWEC Project Manager
US Environmental Protection Agency

FWEC/Church Road TCE Site
Remedial Investigation
Groundwater Sampling Event - Round 1 (May 2013)

Well Location	Sample ID	Location	TCL VOCs+10 (includes additional/select)	Formaldehyde	TCL SVOCs+20	Select SVOCs	1,4-Dioxane	Pesticides	PCBs	Herbicides	TAL Metals	Cyanide	TOC	DOC	BOD	COD	p-Orthophosphate	Total P	Nitrate	Nitrite	TKN	TDS	TSS	Methane, Ethane, Ethene	Chloride	Sulfate	Sulfide	Alkalinity	Ammonia	Ferrous and Ferric Iron	*Dehalococcoides*
CH-1	CH-1	On-site	x	x		x	x																								
CH-10	CH-10	On-site	x	x		x	x																								
CH-11	CH-11	On-site	x	x		x	x																								
CH-12	CH-12	On-site	x	x	x		x	x	x	x	x	x																			
CH-2	CH-2	On-site	x	x		x	x																								
CH-3	CH-3	On-site	x	x		x	x																								
CH-3A	CH-3A	On-site	x	x		x	x																								
CH-4	CH-4	On-site	x	x		x	x																								
CH-5	CH-5	On-site	x	x		x	x																								
CH-6	CH-6	On-site	x	x		x	x																								
CH-7	CH-7	On-site	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
CH-8	CH-8	On-site	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
CH-9	CH-9	On-site	x	x		x	x																								
CT-MW-1D	CT-MW-1D	CertainTeed	x	x		x	x																								
CT-MW-1I	CT-MW-1I	CertainTeed	x	x		x	x																								
CT-MW-1S	CT-MW-1S	CertainTeed	x	x		x	x																								
CT-MW-2S	CT-MW-2S	CertainTeed	x	x		x	x																								
CT-MW-3D	CT-MW-3D	CertainTeed	x	x		x	x																								
CT-MW-3I	CT-MW-3I	CertainTeed	x	x		x	x																								
CT-MW-4D	CT-MW-4D	CertainTeed	x	x		x	x																								
CT-MW-4I	CT-MW-4I	CertainTeed	x	x		x	x																								
CT-MW-5D	CT-MW-5D	CertainTeed	x	x		x	x																								
CT-MW-5I	CT-MW-5I	CertainTeed	x	x		x	x																								
CT-MW-1BR	CT-MW-1BR	CertainTeed	x	x		x	x																								
EPA-1D	EPA-1D	Oak Hill Rd	x	x			x																								
EPA-2DR	EPA-2DR	CertainTeed	x	x		x	x																								
EPA-3D	EPA-3D	HPG	x	x			x																								
FWEC-4R	FWEC-4R	Oak Hill Rd	x	x			x																								
FWEC-5R	FWEC-5R	Oak Hill Rd	x	x			x																								
FWEC-5S	FWEC-5S	Oak Hill Rd	x	x			x																								
FWEC-6M	FWEC-6M	Church Rd	x	x			x																								
FWEC-6R	FWEC-6R	Church Rd	x	x			x																								
FWEC-6S	FWEC-6S	Church Rd	x	x			x																								
MW-1	MW-1	On-site	x	x		x	x																								
MW-10	MW-10	On-site	x	x	x		x	x	x	x	x	x																			
MW-10D	MW-10D	On-site	x	x	x		x	x	x	x	x	x																			
MW-11R	MW-11R	On-site	x	x		x	x																								
MW-12D	MW-12D	On-site	x	x		x	x																								
MW-12R	MW-12R	On-site	x	x		x	x																								
MW-13	MW-13	On-site	x	x		x	x																								
MW-14D	MW-14D	On-site	x	x	x		x	x	x	x	x	x																			
MW-14M	MW-14M	On-site	x	x	x		x	x	x	x	x	x																			
MW-14S	MW-14S	On-site	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
MW-15S	MW-15S	On-site	x	x	x		x	x	x	x	x	x																			
MW-16S	MW-16S	On-site	x	x	x		x	x	x	x	x	x																			
MW-17	MW-17	On-site	x	x		x	x																								
MW-18	MW-18	On-site	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
MW-19	MW-19	On-site	x	x		x	x																								
MW-2	MW-2	On-site	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
MW-3	MW-3	On-site	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
MW-4	MW-4	On-site	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
MW-5	MW-5	On-site	x	x		x	x																								
MW-6	MW-6	On-site	x	x	x		x	x	x	x	x	x																			
MW-7	MW-7	On-site	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
MW-7S	MW-7S	On-site	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
MW-8	MW-8	On-site	x	x		x	x																								
MW-9	MW-9	On-site	x	x	x		x	x	x	x	x	x																			
MW-9D	MW-9D	On-site	x	x	x		x	x	x	x	x	x																			
MD-01	MD-01	On-site	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
RMW-01S-1	RMW-01S-1	CertainTeed	x	x		x	x						x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
RMW-01S-2	RMW-01S-2	CertainTeed	x	x		x	x						x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
RMW-02S-1	RMW-02S-1	Bergen	x	x		x	x						x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
RMW-02S-2	RMW-02S-2	Bergen	x	x		x	x						x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
RMW-04S-1	RMW-04S-1	Oak Hill Rd	x	x		x	x						x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
RMW-04S-2	RMW-04S-2	Oak Hill Rd	x	x		x	x						x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
RMW-04S-3	RMW-04S-3	Oak Hill Rd	x	x		x	x						x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
RMW-05S	RMW-05S	Oak Hill Rd	x	x		x	x																								
RMW-06S	RMW-06S	HPG	x	x		x	x						x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
RMW-07S	RMW-07S	Marchem	x	x		x	x																								
RMW-08S	RMW-08S	Fabri-Kal	x	x		x	x																								
RMW-09S-1	RMW-09S-1	Church Rd	x	x			x						x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	

FWEC/Church Road TCE Site
Remedial Investigation
Groundwater Sampling Event - Round 1 (May 2013)

Well Location	Sample ID	Location	TCL VOCs+10 (includes additional/select)	Formaldehyde	TCL SVOCs+20	Select SVOCs	1,4-Dioxane	Pesticides	PCBs	Herbicides	TAL Metals	Cyanide	TOC	DOC	BOD	COD	p-Orthophosphate	Total P	Nitrate	Nitrite	TKN	TDS	TSS	Methane, Ethane, Ethene	Chloride	Sulfate	Sulfide	Alkalinity	Ammonia	Ferrous and Ferric Iron	*Dehalococcoides*
RMW-09S-2	RMW-09S-2	Church Rd	x	x			x						x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
RMW-10S	RMW-10S	County Dev.	x	x			x																								
RMW-11S	RMW-11S	Church Rd	x	x			x						x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
RMW-12S	RMW-12S	South Mtn	x	x			x						x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
RMW-13S-1	RMW-13S-1	South Mtn	x	x			x																								
RMW-13S-2	RMW-13S-2	South Mtn	x	x			x						x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
RMW-14S	RMW-14S	Church Rd	x	x			x																								
RMW-01D	RMW-01D-1	CertainTeed	x	x		x	x						x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
RMW-01D	RMW-01D-2	CertainTeed	x	x			x																								
RMW-01D	RMW-01D-3	CertainTeed	x	x			x																								
RMW-02D	RMW-02D	Bergen	x	x			x						x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
RMW-03S	RMW-03S	CertainTeed	x	x			x																								
RMW-03D	RMW-03D	CertainTeed	x	x			x																								
RMW-06D	RMW-06D-1	HPG	x	x			x																								
RMW-06D	RMW-06D-2	HPG	x	x			x																								
RMW-06D	RMW-06D-3	HPG	x	x		x	x						x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
RMW-06D	RMW-06D-4	HPG	x	x			x																								
RMW-06D	RMW-06D-5	HPG	x	x			x																								
RMW-06D	RMW-06D-6	HPG	x	x			x																								
RMW-06D	RMW-06D-7	HPG	x	x			x																								
RMW-07D	RMW-07D	Marchem	x	x		x	x																								
RMW-08D	RMW-08D	Fabri-Kal	x	x		x	x																								
RMW-09D	RMW-09D-1	Church Rd	x	x			x																								
RMW-09D	RMW-09D-2	Church Rd	x	x			x																								
RMW-09D	RMW-09D-3	Church Rd	x	x			x						x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
RMW-09D	RMW-09D-4	Church Rd	x	x			x																								
RMW-09D	RMW-09D-5	Church Rd	x	x			x																								
RMW-09D	RMW-09D-6	Church Rd	x	x			x																								
RMW-10D	RMW-10D	County Dev.	x	x			x						x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
RMW-11D	RMW-11D-1	Church Rd	x	x			x						x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
RMW-11D	RMW-11D-2	Church Rd	x	x			x																								
RMW-11D	RMW-11D-3	Church Rd	x	x			x																								
RMW-12D	RMW-12D	South Mtn	x	x			x						x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
RMW-13D	RMW-13D	South Mtn	x	x			x						x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
RMW-14D	RMW-14D	Church Rd	x	x			x																								
EB-01	EB-01	On-site	x	x	x		x	x	x	x	x	x																			
EB-03	EB-03	On-site	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
Total (excluding duplicates and blanks)			108	108	22	46	108	22	22	22	22	22	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	11
	GW-RD1-Dup1		x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	GW-RD1-Dup2		x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
	GW-RD1-Dup3		x	x		x	x																								
	GW-RD1-Dup4		x	x		x	x																								
	GW-RD1-Dup5		x	x			x																								
	GW-RD1-Dup6		x	x			x																								
	GW-RD1-TB1		x																												
	GW-RD1-TB2		x																												
	GW-RD1-TB3		x																												
	GW-RD1-TB4		x																												
	GW-RD1-TB5		x																												
	GW-RD1-TB6		x																												
	GW-RD1-TB7		x																												
	GW-RD1-TB8		x																												
	GW-RD1-TB9		x																												
	GW-RD1-TB10		x																												
	GW-RD1-TB11		x																												
	GW-RD1-TB12		x																												
	GW-RD1-TB13		x																												
	GW-RD1-TB14		x																												
	GW-RD1-TB15		x																												
	GW-RD1-FB1		x	x	x		x	x	x	x	x	x																			
	GW-RD1-FB2		x	x	x		x	x	x	x	x	x																			
	GW-RD1-FB3		x	x	x		x	x	x	x	x	x																			
	GW-RD1-FB4		x	x		x	x																								
	GW-RD1-FB5		x	x		x	x																								
	GW-RD1-FB6		x	x		x	x																								
	GW-RD1-FB7		x	x		x	x																								
	GW-RD1-FB8		x	x		x	x																								
	GW-RD1-FB9		x	x			x																								
	GW-RD1-FB10		x	x			x																								
	GW-RD1-FB11		x	x			x																								
	GW-RD1-FB12		x	x			x																								
	GW-RD1-FB13		x	x			x																								
	GW-RD1-FB14		x	x			x																								
	GW-RD1-FB15		x	x			x																								
Total (duplicates and blanks)			36	21	5	7	21	5	5	5	5	5	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
Grand Total			144	129	27	53	129	27	27	27	27	27	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	12
Representatives of CertainTeed have restricted access to these wells																															

FIELD CHANGE REQUEST (FCR) FORM
FWEC/CHURCH ROAD TCE SITE, MOUNTAIN TOP, PENNSYLVANIA

Project Name: FWEC/Church Road TCE Site Project Number: 106-8706.0031

Client: Foster Wheeler Energy Corp. Request Number: FCR-09

Field Change Request Title: Clarifications/Modifications to Groundwater Sampling Program – Round 2

To: (b) (4), Project Manager Location: Morris Plains, NJ

Date: August 30, 2013

Description:

The following clarifications/modifications to the groundwater sampling program, which were previously approved in FCR-08 for the first round of groundwater sampling, will also be implemented during the second round of groundwater sampling:

1) The Work Plan identified several pump alternatives for the collection of groundwater samples. Groundwater sampling will be performed using bladder pumps.
2) Dedicated polyethylene tubing for both the air and return/sampling lines will be used for groundwater sampling instead of Teflon-lined tubing specified in the Work Plan.
3) Water quality parameters will be considered stabilized based on the specific parameters included in SOP #19, Item #12 (± 0.1 for pH, ± 3 percent for specific conductance, ± 10 percent for dissolved oxygen, ± 10 percent or less than 50 NTU for turbidity, ± 10 mV for Eh), rather than 10% for all parameters as indicated in the Field Sampling Plan, section 3.2.12.
4) Wells will be purged until water quality parameters have stabilized per SOP #19, Item #12, or for a maximum of 2-hours. Samples will be collected after a maximum of 2 hours of purging.

The following additional modifications are proposed for the second round of groundwater sampling:

5) The dedicated polyethylene tubing from each well from the first round of groundwater sampling will be reused within the same well for the second round of groundwater sampling.
6) The attached table identifies the specific analyses for each groundwater sample to be collected during the round 2 sampling event.

Reason for Change:

The following rationale is provided for the additional modifications recommended above. The rationale corresponds numerically with the descriptions cited above:

5) Dedicated polyethylene tubing was used to sample each of the wells during the first round of sampling. The tubing was removed from each of the wells, sealed in individual plastic bags, labeled with the well locations, and stored on-site. The tubing will be reused during the second round of sampling to sample the same well as the first round of sampling.
6) The Work Plan indicates that specific parameters to be analyzed for each well would be determined based on data needs and in consultation with USEPA. This table provides specific recommendations for the analysis of the groundwater sample collected from each well location.

Recommended Disposition:

The above represent clarifications and minor modifications to the Work Plan for items associated with the collection and analysis of groundwater samples for the second groundwater sampling event. It is recommended that the sampling event be performed in accordance with these clarifications and incorporating the minor modifications proposed.

(b) (4) [redacted]
Project Chemist, Tetra Tech, Inc.

(b) (4) [redacted]
Signature

08/30/2013
Date

Disposition:

I have reviewed this change request, and recommend conducting the groundwater sampling investigation (Round 2) in accordance with the Work Plan as clarified/modified above.

(b) (4) [redacted]
Project Manager, Tetra Tech, Inc.

(b) (4) [redacted]
Signature

8/30/13
Date

Distribution:

Project Manager
Field Operations Lead
QA Officer
Project File

Other:
FWEC Project Manager
US Environmental Protection Agency

FWEC/Church Road TCE Site
Remedial Investigation
Groundwater Sampling Event - Round 2 (September 2013)

Well Location	Water Level	Sample ID	Location	TCL VOCs+10 (includes additional/select)	Select SVOCs	1,4-Dioxane
CH-1	x	CH-1	On-site	x		x
CH-10	x		On-site			
CH-11	x		On-site			
CH-12	x		On-site			
CH-2	x		On-site			
CH-3	x		On-site			
CH-3A	x		On-site			
CH-4	x		On-site			
CH-5	x		On-site			
CH-6	x	CH-6	On-site	x		x
CH-7	x	CH-7	On-site	x		x
CH-8	x	CH-8	On-site	x		x
CH-9	x		On-site			
CT-MW-1D			CertainTeed			
CT-MW-1I			CertainTeed			
CT-MW-1S			CertainTeed			
CT-MW-2S			CertainTeed			
CT-MW-3D			CertainTeed			
CT-MW-3I			CertainTeed			
CT-MW-4D			CertainTeed			
CT-MW-4I			CertainTeed			
CT-MW-5D			CertainTeed			
CT-MW-5I			CertainTeed			
CT-MW-1BR			CertainTeed			
EPA-1D	x	EPA-1D	Oak Hill Rd	x		
EPA-2DR	x	EPA-2DR	CertainTeed	x		x
EPA-3D	x	EPA-3D	HPG	x		
FWEC-4R	x	FWEC-4R	Oak Hill Rd	x		
FWEC-5R	x	FWEC-5R	Oak Hill Rd	x		
FWEC-5S	x	FWEC-5S	Oak Hill Rd	x		
FWEC-6M	x	FWEC-6M	Church Rd	x		
FWEC-6R	x	FWEC-6R	Church Rd	x		
FWEC-6S	x	FWEC-6S	Church Rd	x		
MW-1	x	MW-1	On-site	x		x
MW-10	x	MW-10	On-site	x		
MW-10D	x	MW-10D	On-site	x		
MW-11R	x	MW-11R	On-site	x		
MW-12D	x	MW-12D	On-site	x		
MW-12	x	MW-12R	On-site	x		
MW-13	x	MW-13	On-site	x		
MW-14D	x	MW-14D	On-site	x		
MW-14M	x	MW-14M	On-site	x		

FWEC/Church Road TCE Site
Remedial Investigation
Groundwater Sampling Event - Round 2 (September 2013)

Well Location	Water Level	Sample ID	Location	TCL VOCs+10 (includes additional/select)	Select SVOCs	1,4-Dioxane
MW-14S	x	MW-14S	On-site	x		
MW-15S	x	MW-15S	On-site	x		
MW-16S	x	MW-16S	On-site	x		x
MW-17	x	MW-17	On-site	x		
MW-18	x	MW-18	On-site	x		x
MW-19	x	MW-19	On-site	x		x
MW-2	x	MW-2	On-site	x		
MW-3	x	MW-3	On-site	x		
MW-4	x	MW-4	On-site	x		x
MW-5	x	MW-5	On-site	x		
MW-6	x	MW-6	On-site	x		x
MW-7	x	MW-7	On-site	x		x
MW-7S	x	MW-7S	On-site	x		x
MW-8	x	MW-8	On-site	x		
MW-9	x	MW-9	On-site	x		
MW-9D	x	MW-9D	On-site	x		
OW-1	x		On-site			
OW-10	x		On-site			
OW-2	x		On-site			
OW-3	x		On-site			
OW-4	x		On-site			
OW-5	x		On-site			
OW-6	x		On-site			
OW-7	x		On-site			
OW-8	x		On-site			
OW-9	x		On-site			
RW-1	x		On-site			
RW-2	x		On-site			
RW-2R	x		On-site			
RW-2R2	x		On-site			
RW-3	x		On-site			
RW-3R	x		On-site			
RW-4	x		On-site			
MD-01	x	MD-01	On-site	x		x
RMW-01S-1	x	RMW-01S-1	CertainTeed	x		x
RMW-01S-2	x	RMW-01S-2	CertainTeed	x		x
RMW-02S-1	x	RMW-02S-1	Bergen	x		x
RMW-02S-2	x	RMW-02S-2	Bergen	x		x
RMW-04S-1	x	RMW-04S-1	Oak Hill Rd	x		
RMW-04S-2	x	RMW-04S-2	Oak Hill Rd	x		
RMW-04S-3	x	RMW-04S-3	Oak Hill Rd	x		
RMW-05S	x	RMW-05S	Oak Hill Rd	x		

FWEC/Church Road TCE Site
Remedial Investigation
Groundwater Sampling Event - Round 2 (September 2013)

Well Location	Water Level	Sample ID	Location	TCL VOCs+10 (includes additional/select)	Select SVOCs	1,4-Dioxane
RMW-06S	x	RMW-06S	HPG	x		x
RMW-07S	x	RMW-07S	Marchem	x		
RMW-08S	x	RMW-08S	Fabri-Kal	x		
RMW-09S-1	x	RMW-09S-1	Church Rd	x		x
RMW-09S-2	x	RMW-09S-2	Church Rd	x		x
RMW-10S	x	RMW-10S	County Dev.	x		x
RMW-11S	x	RMW-11S	Church Rd	x		x
RMW-12S	x	RMW-12S	South Mtn	x		
RMW-13S-1	x	RMW-13S-1	South Mtn	x		
RMW-13S-2	x	RMW-13S-2	South Mtn	x		
RMW-14S	x	RMW-14S	Church Rd	x		
RMW-01D	x	RMW-01D-1	CertainTeed	x		x
RMW-01D	x	RMW-01D-2	CertainTeed	x		x
RMW-01D	x	RMW-01D-3	CertainTeed	x		x
RMW-02D	x	RMW-02D	Bergen	x		x
RMW-03S	x	RMW-03S	CertainTeed	x		
RMW-03D	x	RMW-03D	CertainTeed	x		
RMW-06D	x	RMW-06D-1	HPG	x		x
RMW-06D	x	RMW-06D-2	HPG	x		x
RMW-06D	x	RMW-06D-3	HPG	x		x
RMW-06D	x	RMW-06D-4	HPG	x		x
RMW-06D	x	RMW-06D-5	HPG	x		x
RMW-06D	x	RMW-06D-6	HPG	x		x
RMW-06D	x	RMW-06D-7	HPG	x		x
RMW-07D	x	RMW-07D	Marchem	x		
RMW-08D	x	RMW-08D	Fabri-Kal	x		
RMW-09D	x	RMW-09D-1	Church Rd	x		x
RMW-09D	x	RMW-09D-2	Church Rd	x		x
RMW-09D	x	RMW-09D-3	Church Rd	x		x
RMW-09D	x	RMW-09D-4	Church Rd	x		x
RMW-09D	x	RMW-09D-5	Church Rd	x		x
RMW-09D	x	RMW-09D-6	Church Rd	x		x
RMW-10D	x	RMW-10D	County Dev.	x		x
RMW-11D	x	RMW-11D-1	Church Rd	x		x
RMW-11D	x	RMW-11D-2	Church Rd	x		x
RMW-11D	x	RMW-11D-3	Church Rd	x		x
RMW-12D	x	RMW-12D	South Mtn	x		
RMW-13D	x	RMW-13D	South Mtn	x		
RMW-14D	x	RMW-14D	Church Rd	x		
EB-01	x	EB-01	On-site	x		
EB-02	x		On-site			
EB-03	x	EB-03	On-site	x		

FWEC/Church Road TCE Site
Remedial Investigation
Groundwater Sampling Event - Round 2 (September 2013)

Well Location	Water Level	Sample ID	Location	TCL VOCs+10 (includes additional/select)	Select SVOCs	1,4-Dioxane
EB-04	x	(b) (6)				
192 Ch Vault				x		
192 Ch Spring				x		
181 Spring				x		
201 Spring				x		
Camp Spring				x	x	x
Stream Gauge 1	x					
Stream Gauge 2	x					
Stream Gauge 3	x		HPG			
Stream Gauge 4	x		Near Fabri-Kal			
Stream Gauge 5	x		(b) (6)			
Stream Gauge 6	x		County Dev.			
Stream Gauge 7	x		South Mtn			
Stream Gauge 8	x		Camp St. George			
Total (excluding duplicates and blanks)				93	1	45
		GW-RD2-Dup1		x		x
		GW-RD2-Dup2		x		x
		GW-RD2-Dup3		x		x
		GW-RD2-Dup4		x		
		GW-RD2-Dup5		x		
		GW-RD2-TB1		x		
		GW-RD2-TB2		x		
		GW-RD2-TB3		x		
		GW-RD2-TB4		x		
		GW-RD2-TB5		x		
		GW-RD2-TB6		x		
		GW-RD2-TB7		x		
		GW-RD2-TB8		x		
		GW-RD2-TB9		x		
		GW-RD2-TB10		x		
		GW-RD2-FB1		x		x
		GW-RD2-FB2		x		x
		GW-RD2-FB3		x		x
		GW-RD2-FB4		x		x
		GW-RD2-FB5		x		x
		GW-RD2-FB6		x		x
		GW-RD2-FB7		x		x

FWEC/Church Road TCE Site
Remedial Investigation
Groundwater Sampling Event - Round 2 (September 2013)

Well Location	Water Level	Sample ID	Location	TCL VOCs+10 (includes additional/select)	Select SVOCs	1,4-Dioxane
		GW-RD2-FB8		x		x
		GW-RD2-FB9		x		x
		GW-RD2-FB10		x		x
Total (duplicates and blanks)				25	0	13
Grand Total				118	1	58
Representatives of CertainTeed have restricted access to these wells						
Analytical Methods:						
Samples will be analyzed using the same analytical methods used during the Round 1 sampling event						
VOCs will be analyzed by Method 8260B						
SVOCs will be analyzed by Method 8270C						
1,4-dioxane will be analyzed by Method 8260B in Selected Ion Mode (SIM)						

FIELD CHANGE REQUEST (FCR) FORM
FWEC/CHURCH ROAD TCE SITE, MOUNTAIN TOP, PENNSYLVANIA

Project Name: FWEC/Church Road TCE Site Project Number: 106-8706.0031

Client: Foster Wheeler Energy Corp. Request Number: FCR-10

Field Change Request Title: Resampling select wells for 1,4-dioxane

To: (b) (4), Project Manager Location: Morris Plains, NJ

Date: March 20, 2014

Description:

Select groundwater monitoring wells will be resampled for 1,4-dioxane to obtain representative samples for this constituent. Samples also will be analyzed for TCL VOCs to evaluate the potential for seasonal variability. The attached table identifies the wells that will be resampled. The table indicates wells that had previous detections of 1,4-dioxane during a prior sampling event, along with all of the FLUTe well intervals. At locations with previous detections of 1,4-dioxane, the associated wells in each well cluster also will be resampled. The table also includes wells where insufficient water was present during the 1st and 2nd groundwater sampling events for sample collection and analysis.

Conventional wells will be resampled using standard low-flow groundwater sampling procedures, in accordance with the Work Plan. FLUTe wells will be purged a minimum of 5 full purge volumes prior to sample collection, in accordance with the standard FLUTe sampling protocol.

For the 1,4-dioxane analysis, the samples will be analyzed using Method 8260 SIM with isotope dilution and heated purge and trap. In addition, blind 1,4-dioxane performance evaluation standards will be submitted for analysis with these samples. The samples also will be analyzed for TCL VOCs plus 10 in accordance with the RI/FS Work Plan.

Reason for Change:

In review of the 1st and 2nd groundwater sampling laboratory results, the reported concentrations of 1,4-dioxane from both rounds of groundwater sampling are suspect, and may not accurately represent the presence or absence of 1,4-dioxane in the groundwater associated with the Mountain Top RI/FS. Independent of the RI/FS sampling activities described in the RI/FS Work Plan, FWEC is in the process of performing additional testing and evaluation of the FLUTe monitoring well system, conventional monitoring well materials, sampling equipment, decontamination materials and laboratory methods used for the analysis of 1,4-dioxane in water.

Based on FWEC's review of the preliminary results from the additional testing, extra precautions will be taken to minimize the potential for contamination of samples with 1,4-dioxane from well construction, sampling and/or decontamination materials. The preliminary results from the additional testing also indicate that Method 8260 SIM with isotope dilution and heated purge and trap provides more accurate 1,4-dioxane results. Blind 1,4-dioxane performance evaluation standards also will be submitted for analysis as an additional measure for quality assurance/quality control.

Recommended Disposition:

The above represents minor modifications to the Work Plan for elements associated with the collection and analysis of groundwater samples to support the Remedial Investigation. It is recommended that this supplemental sampling event be performed in accordance with these proposed modifications.

(b) (4) [redacted] — Project Chemist, Tetra Tech, Inc.

(b) (4) [redacted] — Signature

03/20/2014 — Date

Disposition:

I have reviewed this change request, and recommend conducting the supplemental groundwater sampling in accordance with the Work Plan as modified above.

(b) (4) [redacted] — Project Manager, Tetra Tech, Inc.

(b) (4) [redacted] — Signature

3/20/14 — Date

Distribution:

Project Manager
Field Operations Lead
QA Officer
Project File

Other:
FWEC Project Manager
US Environmental Protection Agency

FWEC/Church Road TCE Site
Remedial Investigation
Supplemental 1,4-Dioxane Sampling Event (April 2014)

Well Location	Sample ID	Rationale
CH-1	CH-1	Not sampled previously - insufficient water
CH-6	CH-6	Not sampled previously - insufficient water
EPA-2DR	EPA-2DR	Previous detection
MW-7	MW-7	Previous detection
MW-7S	MW-7S	Previous detection
MW-16S	MW-16S	Previous detection
MW-18	MW-18	Previous detection
RMW-01S-1	RMW-01S-1	Previous detection
RMW-01S-2	RMW-01S-2	Previous detection
RMW-02S-1	RMW-02S-1	Previous detection
RMW-02S-2	RMW-02S-2	Previous detection
RMW-02D	RMW-02D	Part of well cluster with previous detection
RMW-01D-1	RMW-01D-1	Previous detection
RMW-01D-2	RMW-01D-2	Previous detection
RMW-01D-3	RMW-01D-3	Previous detection
RMW-04S-1	RMW-04S-1	Previous detection
RMW-04S-2	RMW-04S-2	Previous detection
RMW-04S-3	RMW-04S-3	Part of well cluster with previous detection
EPA-1D	EPA-1D	Part of well cluster with previous detection
RMW-06S	RMW-06S	Part of well cluster with previous detection
RMW-06D-1	RMW-06D-1	Previous detection
RMW-06D-2	RMW-06D-2	Previous detection
RMW-06D-3	RMW-06D-3	Previous detection
RMW-06D-4	RMW-06D-4	Previous detection
RMW-06D-5	RMW-06D-5	Previous detection
RMW-06D-6	RMW-06D-6	Previous detection
RMW-06D-7	RMW-06D-7	Previous detection
RMW-09S-1	RMW-09S-1	Part of well cluster with previous detection
RMW-09S-2	RMW-09S-2	Part of well cluster with previous detection
RMW-09D-1	RMW-09D-1	FLUTe/Part of well cluster with previous detection
RMW-09D-2	RMW-09D-2	FLUTe/Part of well cluster with previous detection
RMW-09D-3	RMW-09D-3	Previous detection
RMW-09D-4	RMW-09D-4	Previous detection
RMW-09D-5	RMW-09D-5	Previous detection
RMW-09D-6	RMW-09D-6	Previous detection
RMW-11S	RMW-11S	Part of well cluster with previous detection
RMW-11D-1	RMW-11D-1	FLUTe/Part of well cluster with previous detection
RMW-11D-2	RMW-11D-2	Previous detection
RMW-11D-3	RMW-11D-3	Previous detection
Duplicates	GW-Rd3-Dup1	1 per 20 samples (VOCs and 1,4-dioxane)
	GW-Rd3-Dup2	
Trip Blanks	GW-Rd3-TB1	1 per day of sampling (VOCs and 1,4-dioxane)
	GW-Rd3-TB2	
	GW-Rd3-TB3	
	GW-Rd3-TB4	
Field Blanks	GW-Rd3-FB1	1 per day of conventional well sampling (VOCs and 1,4-dioxane)
	GW-Rd3-FB2	
	GW-Rd3-FB3	
	GW-Rd3-FB4	
PE Samples	GW-Rd3-PE1	1,4-dioxane performance evaluation (PE) samples (1,4-dioxane only)
	GW-Rd3-PE2	2 PE samples submitted per sample shipment
	GW-Rd3-PE3	
	GW-Rd3-PE4	
	GW-Rd3-PE5	
	GW-Rd3-PE6	
	GW-Rd3-PE7	
	GW-Rd3-PE8	

FIELD CHANGE REQUEST (FCR) FORM
FWEC/CHURCH ROAD TCE SITE, MOUNTAIN TOP, PENNSYLVANIA

Project Name: FWEC/Church Road TCE Site Project Number: 106-8706.0031
Client: Foster Wheeler Energy Corp. Request Number: FCR-11
Field Change Request Title: Modification of Decontamination SOP 24

To: (b) (4), Project Manager Location: Morris Plains, NJ
Date: April 4, 2014

Description:

Alconox will be eliminated from Step 1 of SOP 24 for the upcoming groundwater sampling event being performed as presented in FCR-10.

Reason for Change:

As discussed in FCR-10, FWEC has preliminary indications that decontamination materials, specifically Alconox, may contain 1,4-dioxane, which has the potential to contaminate samples that will be analyzed for this parameter. Therefore, the decontamination SOP 24 will be modified to specify only a potable water scrub, potable water rinse, and distilled water rinse.

Recommended Disposition:

The above represents a minor modification to the Work Plan for elements associated with the collection and analysis of groundwater samples to support the Remedial Investigation. It is recommended that the supplemental sampling event presented in FCR-10 be performed in accordance with this proposed modification.

(b) (4)
Project Chemist, Tetra Tech, Inc.

(b) (4)
Signature

04/04/2014
Date

Disposition:

I have reviewed this change request, and recommend conducting the supplemental groundwater sampling in accordance with the Work Plan as modified above.

(b) (4)
Project Manager, Tetra Tech, Inc.

(b) (4)
Signature

4/4/14
Date

Distribution:
Project Manager
Field Operations Lead
QA Officer
Project File

Other:
FWEC Project Manager
US Environmental Protection Agency

FIELD CHANGE REQUEST (FCR) FORM
FWEC/CHURCH ROAD TCE SITE, MOUNTAIN TOP, PENNSYLVANIA

Project Name: FWEC/Church Road TCE Site Project Number: 106-8706.0031

Client: Foster Wheeler Energy Corp. Request Number: FCR-12

Field Change Request Title: Collection of additional sediment samples from the outflow channel of the Former Wastewater Treatment Pond (WWTP) to characterize and delineate metals and PAH concentrations in channel sediments

To: (b) (4), Project Manager Location: Morris Plains, NJ

Date: October 8, 2014

Description:

Collect five (5) additional surface sediment samples for target analyte list (TAL) metals, PAHs, and total organic carbon (TOC) from the Former WWTP outflow channel on the Former FWEC Facility property. The attached figure indicates the proposed sample locations, where depositional sediments will be collected, if present.

Reason for Change:

Results of the initial eco-screening evaluation identified concentrations of select metals (silver and lead) and select PAH compounds were detected in the WWTP outflow channel (SED-04) above individual sediment quality screening levels. Since SED-04 was the downstream sample location, additional sediment samples are necessary to delineate the detected constituents to threshold effects concentration (TEC) or non-exceedance levels.

Recommended Disposition:

The above represents a minor addition of five (5) sediment samples to the proposed sediment sampling effort. This effort will provide additional data to delineate and characterize sediments in the outflow channel below the outfall of the WWTP. It is recommended that these samples be collected for evaluation in the Screening Level Ecological Risk Assessment (SLERA). Sediment samples will be collected in accordance with sampling protocols in the RI/FS Work Plan. Actual sample locations will be selected in the field, based on available depositional sediments, and recorded with a hand-held GPS unit.

(b) (4)
Project Eco-Risk Assessor, Tetra Tech, Inc.

(b) (4)
Signature

10-8-2014
Date

Disposition:

I have reviewed this change request, and recommend conducting the supplemental sediment sampling in accordance with the RI/FS Work Plan as modified above.

(b) (4)
Project Manager, Tetra Tech, Inc.

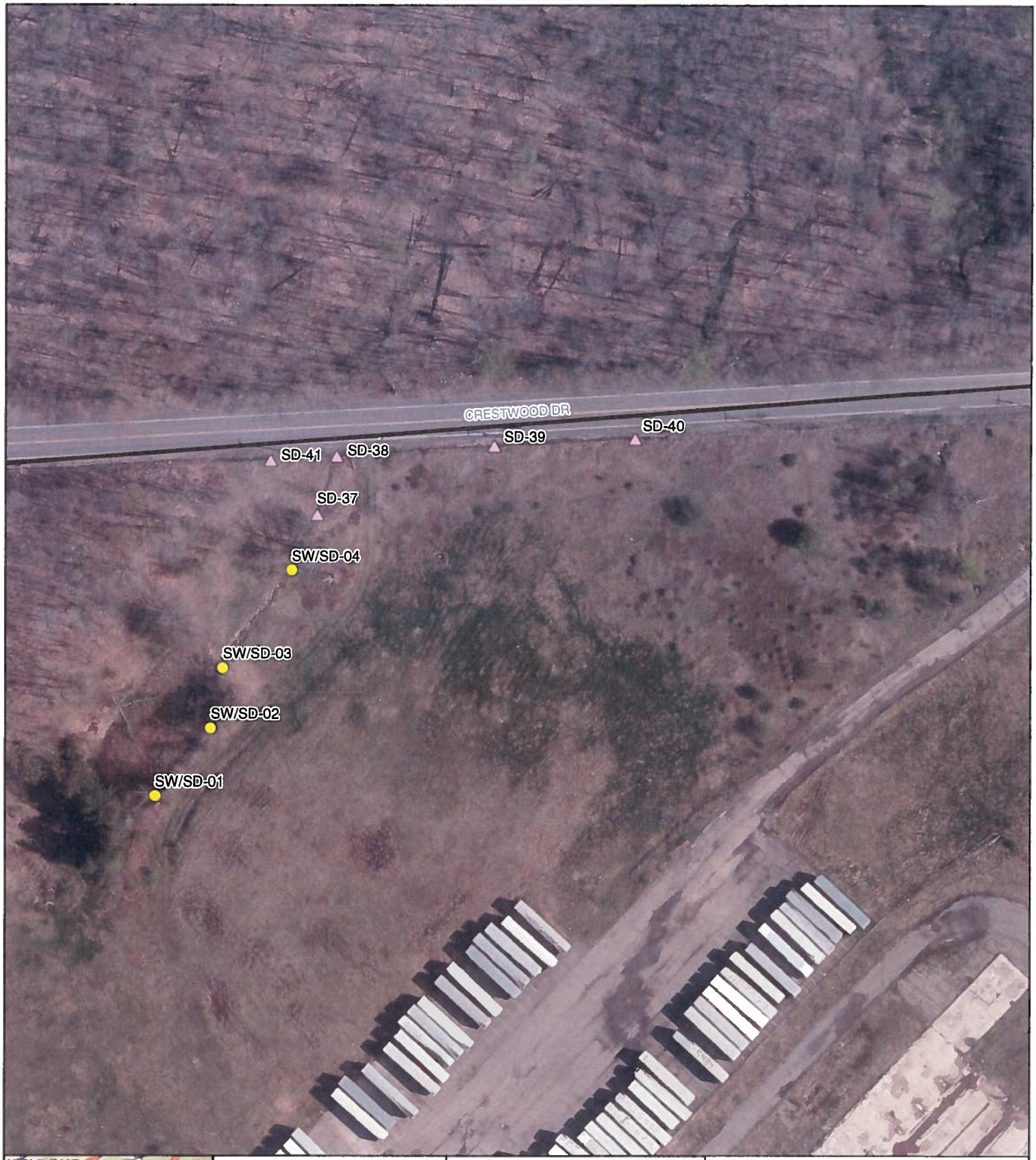
(b) (4)
Signature

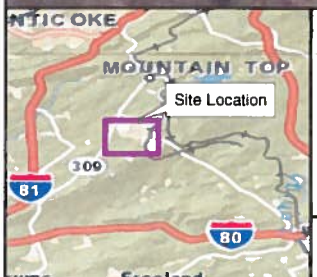
10/8/14
Date

Distribution:

Project Manager
Field Operations Lead
QA Officer
Project File

Other:
FWEC Project Manager
US Environmental Protection Agency





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Feet

SOURCES:

Aerial Photography: Axis Geospatial, 2011

Legend

- Proposed Sediment Sampling Station
- Surface Water/ Sediment Sampling Station
- Former FWEC Facility

TETRA TECH

WASTEWATER TREATMENT POND SURFACE WATER AND SEDIMENT SAMPLING STATIONS

MOUNTAIN TOP, PENNSYLVANIA

Document Path: T:\GIS\Mountain Top, PA\Geospatial\MXD Versions\Risk_Assessment\Proposed_Sediment_Sampling_Stations.mxd

FIELD CHANGE REQUEST (FCR) FORM
FWEC/CHURCH ROAD TCE SITE, MOUNTAIN TOP, PENNSYLVANIA

Project Name: FWEC/Church Road TCE Site Project Number: 106-8706.0031

Client: Foster Wheeler Energy Corp. Request Number: FCR-13

Field Change Request Title: Collection of additional groundwater samples from RMW-09S-1 and RMW-09S-2

To: (b) (4), Project Manager Location: Morris Plains, NJ

Date: October 8, 2014

Description:

Collect additional groundwater samples for target compound list (TCL) VOCs+10 analysis from RMW-09S-1 and RMW-09S-2.

Reason for Change:

The TCE concentration at RMW-09S-1 during the Round 3 groundwater sampling event (April 2014) was inconsistent with several prior samples from this monitoring well, where the detected concentration was approximately three orders of magnitude greater than previously collected samples. An additional groundwater sample will be collected at this location to evaluate whether the April 2014 result is an anomaly, or represents a change in groundwater conditions at this well location. The adjacent shallow well, RMW-09S-2, also will be sampled to assist in the evaluation.

Recommended Disposition:

The above represents a minor addition of two (2) groundwater samples to the groundwater sampling effort. It is recommended that these samples be collected in order to assess the validity of a prior groundwater sample that showed inconsistent results relative to earlier sampling events.

(b) (4) (b) (4) 10/08/2014

Project Chemist, Tetra Tech, Inc. Signature Date

Disposition:

I have reviewed this change request, and recommend conducting the supplemental groundwater sampling in accordance with the RI/FS Work Plan as modified above.

(b) (4) (b) (4) 10/8/14

Project Manager, Tetra Tech, Inc. Signature Date

Distribution:

Project Manager
Field Operations Lead
QA Officer
Project File

Other:
FWEC Project Manager
US Environmental Protection Agency

FIELD CHANGE REQUEST (FCR) FORM
FWEC/CHURCH ROAD TCE SITE, MOUNTAIN TOP, PENNSYLVANIA

Project Name: Supplemental RI | Project Number: 777221621.0004
Client: Foster Wheeler Energy Corporation | Request Number: **FCR-14**
Field Change Request Title: Chromium Speciation

To: (b) (4) t,
FWEC Project Coordinator

Location: Blue Bell, PA

Date: March 16, 2016

Description:

Collect soil, groundwater, sediment, and surface water samples for chromium speciation analysis (i.e., total and hexavalent chromium). Proposed sample locations were selected based on a review of previous soil, groundwater, sediment, and surface water data exhibiting the highest total chromium concentrations.

Reason for Change:

Chromium speciation analysis is being conducted in response to the USEPA comments included in the letter dated September 22, 2015 to the June 2015 DRAFT Remedial Investigation Report. Specifically, we are addressing the USEPA Toxicologist comments on the Baseline Human Health Risk Assessment Report, comments number 21 and 22, and our discussion during our December 7, 2015 meeting with the USEPA. USEPA requested that additional samples be collected and analyzed to evaluate the potential for the presence of hexavalent chromium in soil, groundwater, sediment, and surface water samples where high levels of total chromium were observed.

Recommended Disposition:

The following proposed sample collection and analysis activities for total and hexavalent chromium are in addition to those outlined in the Work Plan and Sampling and Analysis Plan (SAP) for the project. Reference should be made, as required, to these documents for sample collection and management procedures. Additions to Work Plan **Table 3-1**, Field Sampling Plan **Tables 4-**1 and **4-2**, and Quality Assurance Project Plan **Tables 3-9** through **3-12** are attached to this FCR and contain information on these additional activities, including analytical methodologies. The proposed sample locations are shown in the attached **Figure 1**, Chromium Speciation Samples, FWEC/Church Road TCE Site, Mountain Top, PA. The locations may be refined during the field activities based on site-specific conditions at the time of sampling.

- Chromium Speciation Samples – Eight (8) soil sampling locations, one (1) groundwater sampling location, one (1) sediment sampling location, and one (1) surface water sampling location are recommended at locations where the highest concentrations of total chromium were detected during previous sampling. The samples will be collected from the approximate same location and depth and using the same protocol as the previous samples and analyzed for total and hexavalent chromium. The sediment sample will also be analyzed for Total Organic Carbon (TOC).

FIELD CHANGE REQUEST (FCR) FORM – FCR-14
FWEC/CHURCH ROAD TCE SITE, MOUNTAIN TOP, PENNSYLVANIA

(b) (4) [redacted]	[redacted]	3/16/16
Project Manager, Amec Foster Wheeler Environment & Infrastructure, Inc.	Signature	Date

Disposition:

I have reviewed this change request, and recommend conducting additional sampling activities as described above.

(b) (4) [redacted]	(b) (4) [redacted]	3/16/16
FWEC Project Coordinator	Signature	Date

Distribution:

Field Operations Lead
QA Officer
Project File

Other:
US Environmental Protection Agency

FIELD CHANGE REQUEST (FCR) FORM – FCR-14
FWEC/CHURCH ROAD TCE SITE, MOUNTAIN TOP, PENNSYLVANIA

Addition to Table 3-1 of WP

Sample Media or Investigation Method	Technical Approach	Amount of RI Field Investigation Locations	Analytical Parameters[1]	Sampling or Investigation Activity Objective	Data Needs Addressed[2]	Applicable Standard Operating Procedures[3]	Figure Cross-Reference[4]
Chromium Speciation Samples							
Surface Soil	Grab Samples	8	Total Chromium; Hexavalent Chromium	Determine if hexavalent chromium is present	6, 18	23, 24, 26	Figure 1
Groundwater	Low Flow Sampling	1	Total and Dissolved Chromium; Dissolved Hexavalent Chromium	Determine if hexavalent chromium is present	6	11, 18, 19, 23, 24, 25	Figure 1
Sediment	Grab Samples	1	Total Chromium; Hexavalent Chromium; Total Organic Carbon	Determine if hexavalent chromium is present	4, 6, 18	15, 23, 24	Figure 1
Surface Water	Grab Samples	1	Total and Dissolved Chromium; Dissolved Hexavalent Chromium	Determine if hexavalent chromium is present	3, 6	14, 23, 24	Figure 1

[1] – Refer to Tables of the Field Sampling Plan/Quality Assurance Project Plan.
[2] – Refer to Section 2.1 of RI/FS Work Plan.
[3] – See Appendix A of the Field Sampling Plan for SOPs.
[4] – See attached.

FIELD CHANGE REQUEST (FCR) FORM – FCR-14
FWEC/CHURCH ROAD TCE SITE, MOUNTAIN TOP, PENNSYLVANIA

Addition to Table 4-1 of FSP

Sample Type	Total Chromium (soil and sediment) Total and Dissolved Chromium (water)		Hexavalent Chromium (soil and sediment) Dissolved Hexavalent Chromium (water)		Total Organic Carbon	
	Number of Primary Samples	Number of Field Duplicates	Number of Primary Samples	Number of Field Duplicates	Number of Primary Samples	Number of Field Duplicates
PRIMARY						
Surface Soil	8	1	8	1	--	--
Groundwater	1	1	1	1	--	--
Sediment	1	1	1	1	1	1
Surface Water	1	1	1	1	--	--
QUALITY ASSURANCE/QUALITY						
Field Blanks(1)	1	--	1	--	1	--
Trip Blanks	--	--	--	--	--	--
Matrix Spike/Matrix Spike Duplicates	1	--	1	--	1	--

(1) – Only required when non-dedicated, non-disposable equipment is utilized.

FIELD CHANGE REQUEST (FCR) FORM – FCR-14
FWEC/CHURCH ROAD TCE SITE, MOUNTAIN TOP, PENNSYLVANIA

Addition to Table 4-2 of FSP

Sample Type	Matrix	Sampling Device	Parameter (1)	Number of Containers Per Sample	Containers (size and type)	Sample Preservation	Analytical Method	Holding Time
Soil	Soil	Disposable scoop	Hexavalent Chromium	1	4 oz. glass jar	Freeze if possible. Otherwise cool to 0-4°C	BAL SOP 4300	7 days to freeze; one year to analyze
Sediment	Sediment	Disposable scoop	Hexavalent Chromium	1	4 oz. glass jar	Freeze if possible. Otherwise cool to 0-4°C	BAL SOP 4300	7 days to freeze; one year to analyze
Groundwater	Water	Positive displacement submersible or bladder pump with PTFE or stainless steel sample contact	Dissolved Hexavalent Chromium	1	125 mL PE	Field Filter with 0.45 micron filter, container preserved with NH4OH/(NH4)2SO4 buffer to pH > 9.0 - 9.5; zero headspace; keep dark; keep at ≤ 6 °C without freezing during shipment	BAL SOP 4300	28 days
Surface Water	Water	Direct Collection	Dissolved Hexavalent Chromium	1	125 mL PE	Field Filter with 0.45 micron filter, container preserved with NH4OH/(NH4)2SO4 buffer to pH > 9.0 - 9.5; zero headspace; keep dark; keep at ≤ 6 °C without freezing during shipment	BAL SOP 4300	28 days
Field Blanks	Water	Collect rinsate passed over or through sampling device	Dissolved Hexavalent Chromium	1	125 mL PE	Container preserved with NH4OH/(NH4)2SO4 buffer to pH > 9.0 - 9.5; zero headspace; keep dark; keep at ≤ 6 °C without freezing during shipment	BAL SOP 4300	28 days

(1) – QAPP Tables 3-9 through 3-12 provide lists of analytes and detection limits.

FIELD CHANGE REQUEST (FCR) FORM – FCR-14
FWEC/CHURCH ROAD TCE SITE, MOUNTAIN TOP, PENNSYLVANIA

Addition to Table 3-9 of QAPP (Soil)

Constituent	CAS Number	Analytical Method		Achievable Laboratory Limits		Most Stringent USEPA RSL
		MDLs	Method QLs	MDLs	QLs	
Hexavalent Chromium (BAL SOP 4300)						
Hexavalent Chromium	18540-29-9	N/A	N/A	0.007	0.02	0.3

Notes:

All units in mg/kg.
CAS - Chemical Abstracts Service
MDL - Method Detection Limit
mg/kg - Milligram per Kilogram
QL - Quantitation Limit
TAL - Target Analyte List
N/A – Not Applicable

FIELD CHANGE REQUEST (FCR) FORM – FCR-14
FWEC/CHURCH ROAD TCE SITE, MOUNTAIN TOP, PENNSYLVANIA

Addition to Table 3-10 of QAPP (Groundwater)

Constituent	CAS Number	Analytical Method		Achievable Laboratory Limits		Most Stringent USEPA RSL
		MDLs	Method QLs	MDLs	QLs	
Hexavalent Chromium (BAL SOP 4300)						
Hexavalent Chromium	18540-29-9	N/A	N/A	0.003	0.01	0.035

Notes:

All units in ug/L
CAS - Chemical Abstracts Service
MDL - Method Detection Limit
µg/L - Microgram per Liter
QL - Quantitation Limit
N/A – Not Applicable

FIELD CHANGE REQUEST (FCR) FORM – FCR-14
FWEC/CHURCH ROAD TCE SITE, MOUNTAIN TOP, PENNSYLVANIA

Addition to Table 3-11 of QAPP (Surface Water)

Constituent	CAS Number	Analytical Method		Achievable Laboratory Limits		Most Stringent USEPA RSL
		MDLs	Method QLs	MDLs	QLs	
Hexavalent Chromium (BAL SOP 4300)						
Hexavalent Chromium	18540-29-9	N/A	N/A	0.003	0.01	3.5

Notes:

All units in µg/L

(1) - Limit achievable by using Selective Ion Monitoring

CAS - Chemical Abstracts Service

MDL - Method Detection Limit

QL - Quantitation Limit

TAL - Target Analyte List

µg/L - Microgram per Liter

QL - Quantitation Limit

FIELD CHANGE REQUEST (FCR) FORM – FCR-14
FWEC/CHURCH ROAD TCE SITE, MOUNTAIN TOP, PENNSYLVANIA

Addition to Table 3-12 of QAPP (Sediment)

Constituent	CAS Number	Analytical Method		Achievable Laboratory Limits		Most Stringent USEPA RSL
		MDLs	Method QLs	MDLs	QLs	
Hexavalent Chromium (BAL SOP 4300)						
Hexavalent Chromium	18540-29-9	N/A	N/A	0.007	0.02	3
Total Organic Carbon (Walkley Black)						
Total Organic Carbon	7440-44-0	N/A	N/A	394	1000	No RSL

Notes:

All units in mg/kg
CAS - Chemical Abstracts Service
MDL - Method Detection Limit
mg/kg - Milligram per Kilogram
QL - Quantitation Limit

SOURCES

- PLAN ENTITLED "SITE PLAN", PREPARED BY TETRA TECH, 2015.
- AERIAL FROM AXIS GEOSPATIAL, 2011.

0 200' 400'

SCALE: 1" = 400'

LEGEND

FCR-03-C	CHROMIUM SPECIATION SAMPLE
EB-01-C	GROUNDWATER CHROMIUM SPECIATION SAMPLE
SW-06-C	SURFACE WATER CHROMIUM SPECIATION SAMPLE
SD-02-C	SEDIMENT CHROMIUM SPECIATION SAMPLE

CLIENT

FOSTER WHEELER ENERGY CORPORATION

PROJECT

FWEC / CHURCH ROAD TCE SITE MOUNTAIN TOP, PA

PROJECT NO.: 777221621

PREPARED BY: PJC

CHECKED BY: JPM

REVISION NO.: 0

FIGURE NO.: 1

Amec Foster Wheeler
Environment & Infrastructure, Inc.
751 Arbor Way, Suite 180
Blue Bell, PA 19422
Tel. 610-828-8100
www.amecfw.com

PROPOSED CHROMIUM SPECIATION SAMPLE LOCATIONS

\\phl-fs1\FWEC_Secure\Mt Top\2016 RI Work Plans\FWEC Mountain Top Background Soil-Chromium Speciation Figures.dwg Wed, 02 Mar 2016 - 5:47pm philip.carney Layout: Fig 1 Prop Chromium Speciation Sample Locations

FIELD CHANGE REQUEST (FCR) FORM – FCR-15
FWEC/CHURCH ROAD TCE SITE, MOUNTAIN TOP, PENNSYLVANIA

Project Name: Supplemental RI | Project Number: 777221621.0004
Client: Foster Wheeler Energy Corporation | Request Number: **FCR-15**
Field Change Request Title: Background Soil Sampling

To: (b) (4) [redacted], FWEC Project Coordinator | Location: Blue Bell, PA

Date: April 8, 2016

Description:

Collect soil samples from areas on the former Foster Wheeler Energy Corporation Site that have not been impacted by previous industrial activity in order to document native or "background" concentrations for metals. Proposed sample locations were selected from areas that have not been impacted by onsite or offsite activities based on Site and surrounding history. Soil samples will be analyzed for the Target Analyte List (TAL) metals and cyanide.

Reason for Change:

Background soil sampling and analysis is being conducted in response to the USEPA comments included in the letter dated September 22, 2015 to the June 2015 DRAFT Remedial Investigation Report. Specifically, we are addressing the USEPA Hydrogeologist comments on the Remedial Investigation Report, comment number 21, and the USEPA Toxicologist comments on the Baseline Human Health Risk Assessment Report, comments number 13 and 16, and our discussion during our December 7, 2015 meeting with the USEPA. USEPA requested that additional samples be collected and analyzed to evaluate background concentrations.

Recommended Disposition:

The following proposed sample collection and analysis activities for Target Analyte List (TAL) metals and cyanide are in addition to those outlined in the Work Plan and Sampling and Analysis Plan (SAP) for the project. Reference should be made, as required, to these documents for sample collection and management procedures. Additions to Work Plan **Table 3-1**, Field Sampling Plan **Tables 4-**1 and **4-2**, and Quality Assurance Project Plan **Tables 3-9** and **3-10** are attached to this FCR and contain information on these additional activities, including analytical methodologies. The proposed sample locations are shown in the attached **Figure 1**, Background Samples, FWEC/Church Road TCE Site, Mountain Top, PA. The locations may be refined during the field activities based on site-specific conditions at the time of sampling.

- Background Soil Samples – Ten (10) soil sampling locations are recommended in areas deemed unaffected by historical onsite or offsite activities throughout the entire Site property. Two soil samples will be collected from each location from depths of 0 to 6 inches and 1 to 2 feet below ground surface (bgs) and analyzed for TAL metals (including hexavalent chromium) and cyanide. If hexavalent chromium is not detected in samples collected in accordance with FCR-14, Chromium Speciation, then hexavalent chromium analysis will not be included.

(b) (4)	(b) (4)	4/8/16
Project Manager, Amec Foster Wheeler Environment & Infrastructure, Inc.	Signature	Date

Disposition:

I have reviewed this change request, and recommend conducting additional sampling activities as described above.

(b) (4)	(b) (4)	4/8/16
FWEC Project Coordinator	Signature	Date

Distribution:

Field Operations Lead
QA Officer
Project File

Other:
US Environmental Protection Agency

FIELD CHANGE REQUEST (FCR) FORM – FCR-15
FWEC/CHURCH ROAD TCE SITE, MOUNTAIN TOP, PENNSYLVANIA

Addition to Table 3-1 of WP

Sample Media or Investigation Method	Technical Approach	Amount of RI Field Investigation Locations	Analytical Parameters[1]	Sampling or Investigation Activity Objective	Data Needs Addressed[2]	Applicable Standard Operating Procedures[3]	Figure Cross-Reference[4]
Background Samples							
Surface Soil (zero to 6 inches bgs)	Grab Samples	10	TAL Metals (including Hexavalent Chromium) and Cyanide	Establish Background Concentrations for Metals and Cyanide	6	26	Figure 1
Subsurface Soil (1 – 2 feet bgs)	Hand Auger	10	TAL Metals (including Hexavalent Chromium) and Cyanide	Establish Background Concentrations for Metals and Cyanide	6	27	Figure 1

[1] – Refer to Tables of the Field Sampling Plan/Quality Assurance Project Plan; hexavalent chromium analysis not required if hexavalent chromium is not detected in samples collected under FCR-14, Chromium Speciation.

[2] – Refer to Section 2.1 of RI/FS Work Plan.

[3] – See Appendix A of the Field Sampling Plan for existing SOPs and attached for new SOP 27.

[4] – See attached.

FIELD CHANGE REQUEST (FCR) FORM – FCR-15
FWEC/CHURCH ROAD TCE SITE, MOUNTAIN TOP, PENNSYLVANIA

Addition to Table 4-1 of FSP

Sample Type	Cyanide		TAL Metals (including Hexavalent Chromium)[2]	
	Number of Primary Samples	Number of Field Duplicates	Number of Primary Samples	Number of Field Duplicates
PRIMARY SAMPLES				
Surface Soil (0 to 6 inches)	10	1	10	1
Subsurface Soil (1 to 2 feet)	10	1	10	1
QUALITY ASSURANCE/QUALITY CONTROL				
Field Blanks[1]	1	--	1	--
Trip Blanks	--	--	--	--
Matrix Spike/Matrix Spike Duplicates	1	--	1	--

(1) – Only required when non-dedicated, non-disposable equipment is utilized.
(2) – Hexavalent chromium analysis not required if hexavalent chromium is not detected in samples collected under FCR-14, Chromium Speciation.

FIELD CHANGE REQUEST (FCR) FORM – FCR-15
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Addition to Table 4-2 of FSP

Sample Type	Matrix	Sampling Device	Parameter (1)	Number of Containers Per Sample	Containers (size and type)	Sample Preservation	Analytical Method	Holding Time
Soil	Soil	Disposable scoop	Hexavalent Chromium	1	4 oz. glass jar	Freeze if possible. Otherwise cool to 0-4°C	BAL SOP 4300	7 days to freeze; one year to analyze
Field Blanks	Water	Collect rinsate passed over or through sampling device	Dissolved Hexavalent Chromium	1	125 mL PE	Container preserved with NH4OH/(NH4)2SO4 buffer to pH > 9.0 - 9.5; zero headspace; keep dark; keep at ≤ 6 °C without freezing during shipment	BAL SOP 4300	28 days

(1) – QAPP Tables 3-9 and 3-10 provide lists of analytes and detection limits; hexavalent chromium analysis not required if hexavalent chromium is not detected in samples collected under FCR-14, Chromium Speciation.

FIELD CHANGE REQUEST (FCR) FORM – FCR-15
FWEC/CHURCH ROAD TCE SITE, MOUNTAIN TOP, PENNSYLVANIA

Addition to Table 3-9 of QAPP (Soil)

Constituent	CAS Number	Analytical Method		Achievable Laboratory Limits		Most Stringent USEPA RSL
		MDLs	Method QLs	MDLs	QLs	
Hexavalent Chromium (BAL SOP 4300)						
Hexavalent Chromium	18540-29-9	N/A	N/A	0.007	0.02	0.3

Notes:

All units in mg/kg.
CAS - Chemical Abstracts Service
MDL - Method Detection Limit
mg/kg - Milligram per Kilogram
QL - Quantitation Limit
Hexavalent chromium analysis not required if hexavalent chromium is not detected in samples collected under FCR-14, Chromium Speciation.

FIELD CHANGE REQUEST (FCR) FORM – FCR-15
FWEC/CHURCH ROAD TCE SITE, MOUNTAIN TOP, PENNSYLVANIA

Addition to Table 3-10 of QAPP (Water)

Constituent	CAS Number	Analytical Method		Achievable Laboratory Limits		Most Stringent USEPA RSL
		MDLs	Method QLs	MDLs	QLs	
Hexavalent Chromium (BAL SOP 4300)						
Hexavalent Chromium	18540-29-9	N/A	N/A	0.003	0.01	0.035

Notes:

All units in ug/L
CAS - Chemical Abstracts Service
MDL - Method Detection Limit
µg/L - Microgram per Liter
QL - Quantitation Limit
N/A – Not Applicable
Hexavalent chromium analysis not required if hexavalent chromium is not detected in samples collected under FCR-14, Chromium Speciation

FIELD CHANGE REQUEST (FCR) FORM – FCR-15
FWEC/CHURCH ROAD TCE SITE, MOUNTAIN TOP, PENNSYLVANIA

Hand Auger Soil Sampling (SOP 27)

1. Use either a disposable plastic or a decontaminated stainless steel spoon, shovel, trowel, grab sampler, or corer to scrape away surficial organic material (grass, leaves, etc.).

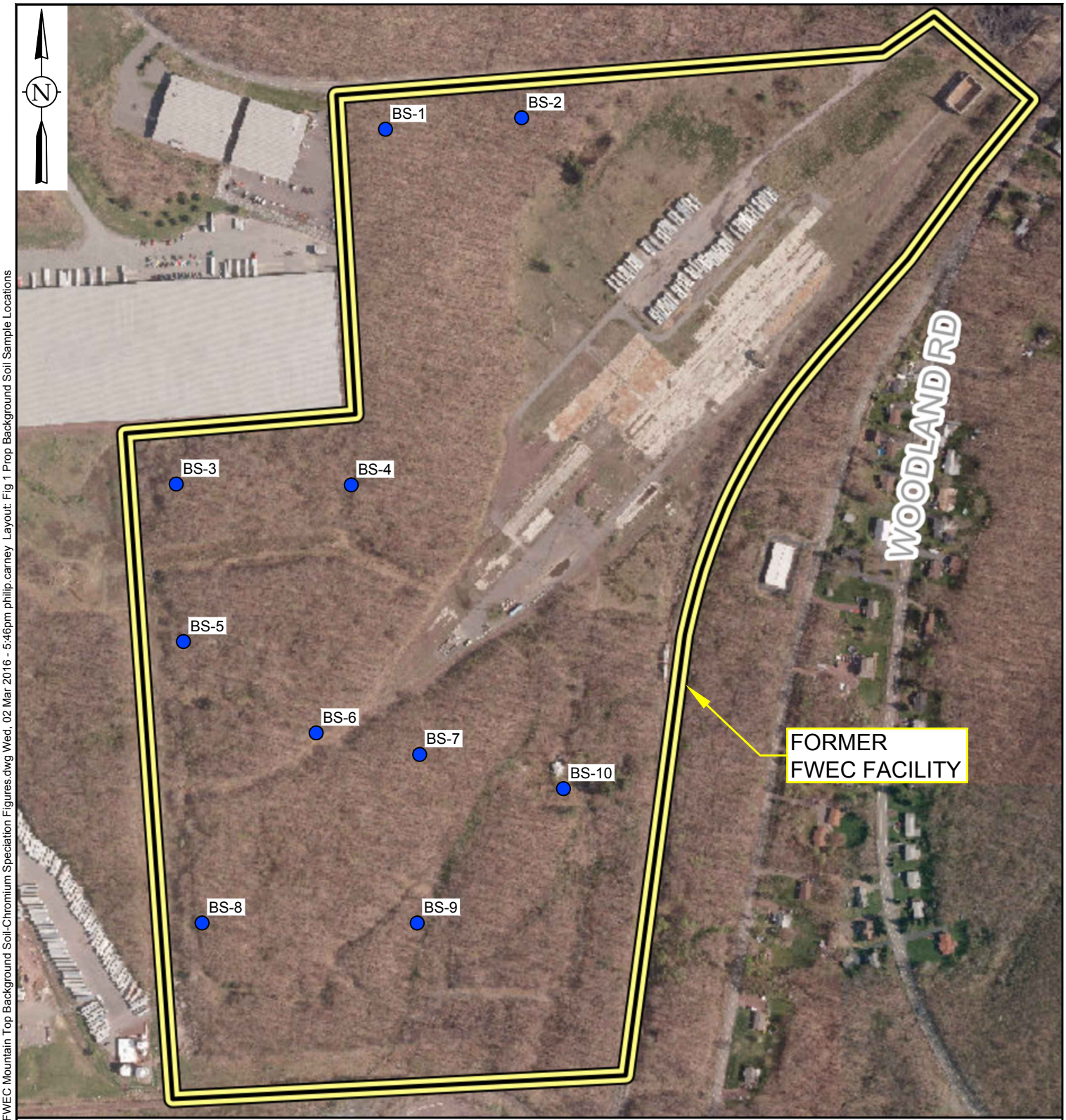
2. The hand auger is generally comprised of a short, hollow, thin-walled augers connected to a "T" shaped handle. Clockwise rotation of the T-handle with moderate downward pressure initiates the cutting and soil sampling process. Some augers are designed to accommodate an optional, plastic or metal, cylindrical sample sleeve that can be inserted into the body of the auger to facilitate sample collection and to avoid cross-contamination. The use of sampling sleeves is not necessary if adequate decontamination is performed between sampling locations and/or depths (unless sampling sleeves are specified).

3. Advance the auger to the required depth, then slowly remove the auger and collect the soil sample from the auger flight at the point corresponding to the required depth. Re-insert and continue augering if deeper samples are required. If samples are required from sandy or non-cohesive soil, use of a hand trowel or shovel may be necessary. Soil samples obtained directly from auger flights are, at best, composite samples over a portion of the auger hole. Samples should only be taken from auger-flights when composite samples are desired.

4. Fill sample containers for the required chemical parameters.

5. Complete sample labels and chain of custody forms. Record sample information in the field logbook.

6. Place the analytical samples in coolers for shipment and chill to $\leq 4^{o}C$.



0 200' 400'

SCALE: 1" = 400'

LEGEND

BS-5 BACKGROUND SOIL SAMPLE

SOURCES

- PLAN ENTITLED "SITE PLAN", PREPARED BY TETRA TECH, 2015.
- AERIAL FROM AXIS GEOSPATIAL, 2011.

CLIENT

FOSTER WHEELER ENERGY CORPORATION

PROJECT

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PROPOSED
BACKGROUND SOIL SAMPLE
LOCATIONS

PROJECT NO.: 777221621
PREPARED BY: PJC
CHECKED BY: JPM
REVISION NO.: 0
FIGURE NO.: 1

\\phl-fs1\FWEC_Secure\Mt Top\2016 RI Work Plans\FWEC Mountain Top Background Soil-Chromium Speciation Figures.dwg Wed, 02 Mar 2016 - 5:46pm philip.carney Layout: Fig 1 Prop Background Soil Sample Locations